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Evolution of initial stage fluctuations in the Glasma

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By describing the initial stage of heavy ion collisions in terms of freely-evolving classical fields, we perform a first-principles calculation of the energy density one- and two-point correlation functions at finite proper time. Our approach allows us to systematically resum the contributions of high momentum modes that would make a power series expansion in proper time divergent. In order to obtain numerical results we evaluate the field correlators using the Glasma Graph approximation and the simple GBW saturation model. Our results provide analytical insight into the pre-equilibrium phase of heavy ion collisions. Upon further refining of our calculations, our expressions could be applied to constrain the initial conditions of hydrodynamical evolution, as well as potentially save computing time for models based on numerical solutions to the Yang-Mills equations.

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